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EXAMINER

CLOW, LORI A

| ART UNIT | PAPER NUMBER |
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1631

DATE MAILED: 08/26/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/830,011

Applicant(s)

SMYTHE ET AL.

Examiner

Lori A. Clow, Ph.D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 16-19 and 27-40 is/are pending in the application.
- 4a) Of the above claim(s) 1, 3, 4, 16, 17 and 39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2, 5-7, 18, 19, 27-38 and 40 is/are rejected.
- 7) ☒ Claim(s) 18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Applicants' arguments, filed 17 June 2003, have been fully considered. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claims 1-7, 16-19, and 27-40 are currently pending.

Applicant states at page 3 and page 7 of the response dated 23 June 2003 that claims 2-7, 18, 19, 29, and 30 are **withdrawn**. However, these claims are still a part of the originally elected invention and are currently pending. Applicant must **cancel** these claims if that is the intent. Page 2 of the response states that these claims are deleted; however this is not an explicit direction by applicant to cancel the claims. See M.P.E.P. 714.III.

Election/Restrictions

Amended claims 1, 3, 4, 16-17, and newly submitted claim 39 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The original invention was drawn to a method of protein engineering. The newly claimed method is directed to a method of identifying a framework protein for subsequent engineering which recites a combination of limitations that are not found in the original claims. The claims now reflect an intended use that is different from the originally searched invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 1, 3, 4, 16-17, and newly submitted claim 39 are withdrawn

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from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

An action on the merits of claims 2, 5-7, 18-19, 27-38, and 40, as they read on the originally elected invention, follows.

Claim Objections

Claims 18 and 19 are objected to for depending from cancelled claim 9.

Claim Rejections - 35 USC § 112

For reasons set forth in the previous Office Action and reiterated below, claims 2, 5-7, 18, 19, 31-38 and 40 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In *In re Wands* (8 USPQ2d 1400 (CAFC 1988)) the CAFC considered the issue of enablement in molecular biology. The CAFC summarized eight factors to be considered in a determination of "undue experimentation". These factors include: (a) the quantity of experimentation necessary; (b) the amount of direction or guidance presented; (c) the presence or absence of working examples; (d) the nature of the invention; (e) the state of the prior art; (f) the relative skill of those in the art; (g) the predictability of the art; and (h) the breadth of the claims.

In considering the factors for the instant claims:

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a) In order to practice the claimed invention one of skill in the art must be able to engineer a protein. The claims set forth query sequence comparisons. For the reasons discussed below, this constitutes undue experimentation.

b) and c) The specification provides examples of identifying framework proteins suitable for further modification by matching and comparing query protein sequence to known database sequences (pages 21). However, nowhere in the specification are proteins engineered using this method. Proteins are engineered **after** the method steps of query and search, as exemplified on page 39, Example 4, which describes the steps of the instant methods to determine the “best” hit for a growth hormone agonist. However, after the best hit is determined, residues are subjected to molecular modeling for further matching and determination of specific residues to mutate. After these additional steps, not presented in the originally filed claims, a protein is synthesized using a solid phase technique. Therefore, at best, proteins in the originally filed method are queried to find structural similarities so that a particular protein can further be modified.

d) The invention is drawn to methods of structural framework identification.

e) and f) One of skill in the art would not be able to practice the said invention because there is no guidance as to how to engineer a protein using the claimed method. One of skill in the art could, in the best case scenario, identify proteins suitable for further modification.

f) The skill of those in the art of molecular biology is high. However, absent further guidance, one of skill in the art could not engineer proteins using the claimed method.

g) The prior art indicates that it is possible to submit query sequences in order to compare similarities and difference in hopes of identifying useful compounds. However, query comparison to a know sequence will not produce or engineer a protein.

Applicant argues that the specification is “replete with examples of engineered framework proteins.” While the engineering of proteins is described in the specification as a step that occurs **after** the identification of framework proteins, the steps of the methods outlined in the specification are not reflected in the instant **claims**. For instance, in example 4, page 39 of the specification C α -C β vectors of a growth hormone agonist were used in a VECTRIX search. Assumingly, the VECTRIX program, as described, allows one to conduct the query and search to identify appropriate hits. However, the method stops here. There is nothing in the claims that would guide one in the process of engineering a particular framework protein based upon “hits” from a database.

Claim ~~27~~³⁰ and ~~30~~ remain rejected under **35 U.S.C. 112, second paragraph**, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 29 and 30 contain the trademark/trade names VECTRIX and POSTVEC. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is

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used to identify/describe a computer program of the instant invention and, accordingly, the identification/description is indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 27-30 remain rejected under 35 U.S.C. 102(b) as being anticipated by Lauri et al. (Journal of Computer Aided Molecular Design, Vol. 8 (1994) pages 51-66).

Lauri et al. disclose the computer program, CAVEAT, which was devised to facilitate structure-based design of enzyme inhibitors and related biologically active molecules. **The program may be used for any such project attempting to identify proteins that are similar to query proteins.** The CAVEAT search engine is designed to retrieve from a database of 3D structure molecules with specific bonds that **match a vector relationship specified in the query.** The geometrical attributes of the bonds, rather than their chemical or electronic character, are the primary issue. The representation of the specific bonds in the database structures as vectors, and the pre-organization of a database around pre-computed pairs of such vectors (vector pairs) are the key features of the CAVEAT search process (see again page 53, 1st and 2nd paragraph). Furthermore, the choice of vector pairs may comprise a variety of sources, such as a database comprising vector pairs of substituents of cyclic or polycyclic molecules (page 54, 2nd paragraph). Claims 29 and 30, while incorporating the names VECTRIX and

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POSTVEC, are not different from the program CAVEAT and are also rejected. The programs, regardless of the name, are the same.

Applicant argues that the search in Lauri is done by breaking down the query into a list of binned and indexed vector pairs, while the present invention is directed to comparison of unbinned distances between vectors. There is nothing in claim 27 that requires comparisons of unbinned distances and the claims still read on the prior art of Lauri et al. as stated above.

No claims are allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

No claims are allowed.

Inquiries

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242, or (703) 308-4028.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lori A. Clow, Ph.D., whose telephone number is (703) 306-5439. The examiner can normally be reached on Monday-Friday from 10am to 6:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Woodward, Ph.D., can be reached on (703) 308-4028.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Legal Instrument Examiner, Tina Plunkett, whose telephone number is (703) 305-3524, or to the Technical Center receptionist whose telephone number is (703) 308-0196.

Marjorie A. Moran
MARJORIE MORAN
PATENT EXAMINER

August 21, 2003

Lori A. Clow, Ph.D.

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Lori A. Clow